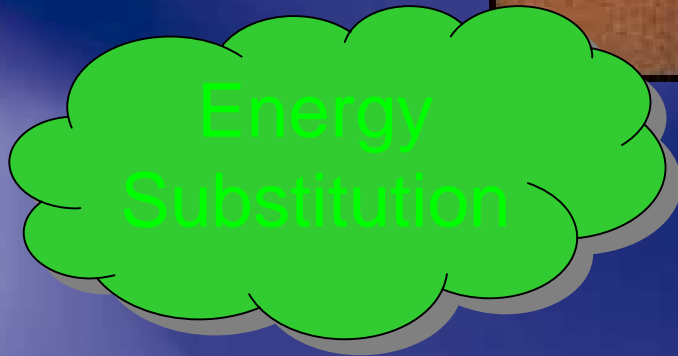
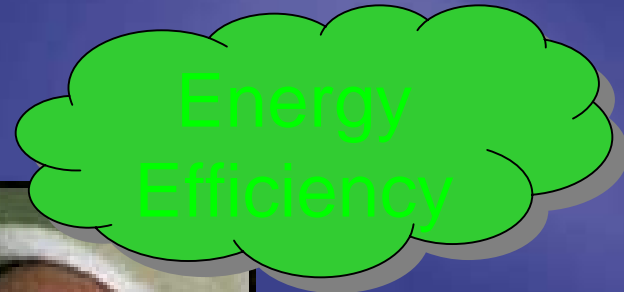


# Hydrogen

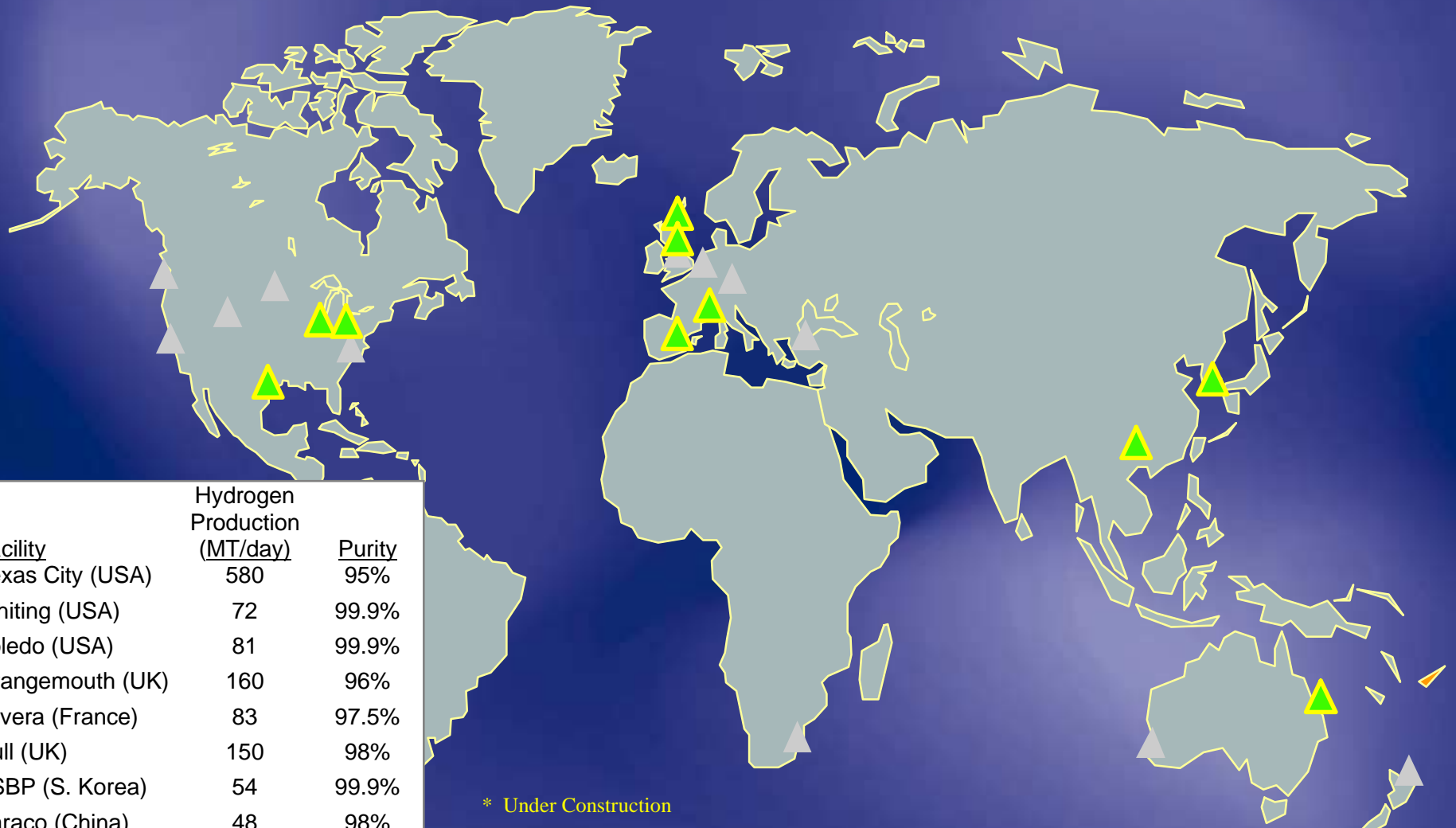


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# Key Strategic Issues



# BP Hydrogen Production

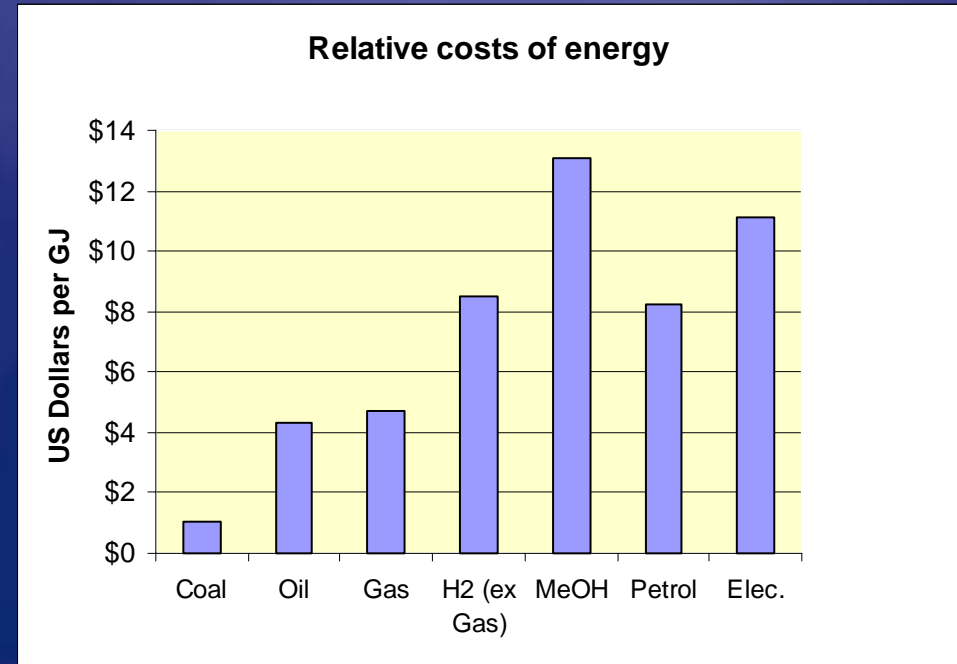


<u>Facility</u>	<u>Hydrogen Production (MT/day)</u>	<u>Purity</u>
Texas City (USA)	580	95%
Whiting (USA)	72	99.9%
Toledo (USA)	81	99.9%
Grangemouth (UK)	160	96%
Lavera (France)	83	97.5%
Hull (UK)	150	98%
SSBP (S. Korea)	54	99.9%
Yaraco (China)	48	98%
Castellon (Spain)	21*	99.9%
<u>Bulwer Island (Aus)</u>	<u>78*</u>	99.9%
Total	1350	

**Excludes production of low-purity hydrogen streams from catalytic reformers**

# Fuel at affordable prices?

- Cost
- Performance vs. others
- Hydrogen fuel availability
- Hydrogen fuel cost
- Resistance to change



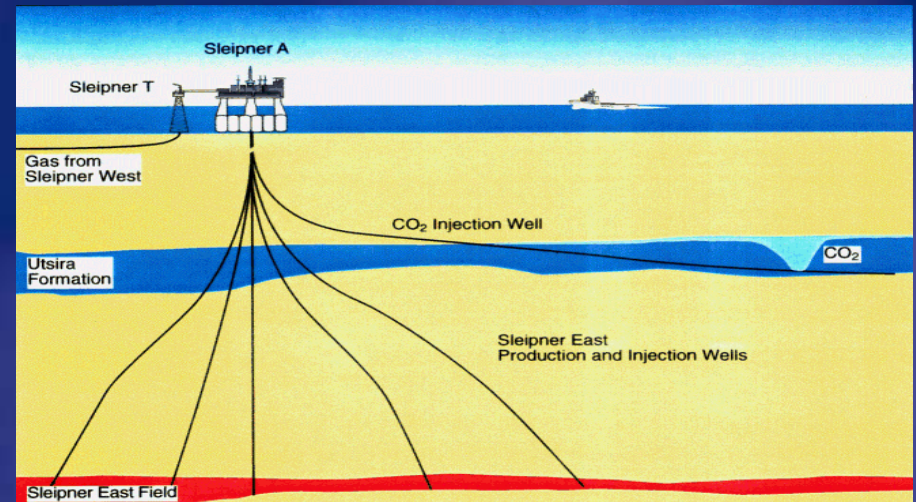
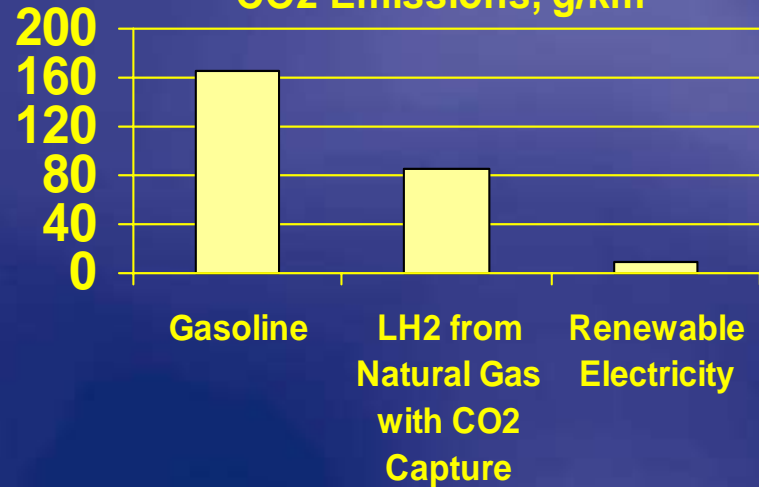
Indicative wholesale costs, US

# Future of Energy Markets - Hydrogen

➤ Detailed well to wheels analysis to determine fuel life cycle emissions for various fuels and vehicle technology.

➤ Developing leadership in carbon capture and sequestration technology which would allow fossil based hydrogen production with very low emissions.

**Internal Combustion Engine  
CO2 Emissions, g/km**





# Challenges for the Refuelling Station



...Current status of hydrogen  
refuelling:

- Expensive
- Limited Hydrogen storage
- Too large space requirements



...Meeting our customers needs:

- Fuel at competitive prices
- Confidence about safety
- Easy refuelling
- Fuel widely available

# Future of Energy Markets - Fuel Cell Transport

Fuelled by hydrogen



# BP Planned Hydrogen Refuelling Stations

